TOOL • DIE • MACHINE

PROGRESS

Official Publication of SPECIAL TOOL, DIE and MACHINE SHOP INDUSTRY

JIGS • FIXTURES • GAGES • MOLDS • SPECIALTIES
MACHINE SHOP PRACTICE • PRODUCTION

PUBLISHED in the INTEREST of MANUFACTURERS and USERS of CUSTOM-BUILT TOOLS, DIES, MACHINES and ACCESSORIES

August
1936

Vol. 2
No. 6

WELDON PRESENTS

A *New* END-MILL

for Improved Performance

1—Stronger Teeth
New parabolic curved teeth mean heavier flutes for equal chip clearance.

2—More Chip Clearance
New cupped end and re-designed end-teeth prevent breaking.

The above features, combined with the regular Wel-Don hollow-ground flutes, double back-off and fast spiral, make this new endmill 50% Stronger and Twice as Fast Cutting as formerly.

Prove this—in Your Own Shop

THE WELDON TOOL CO.
321 FRANKFORT AVE.
CLEVELAND, OHIO

"Pioneers in Fast Spiral Double-end End-Mills"

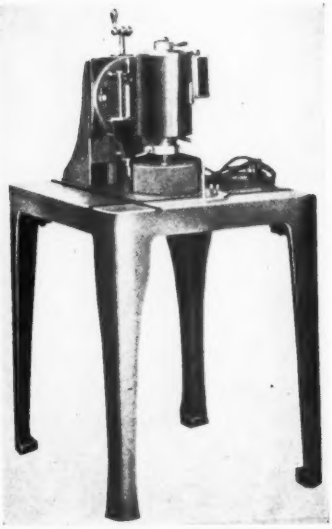
SHEET METAL DIES

Unexcelled facilities for the manufacture of all sizes—from the largest to the smallest

COMPLETE PATTERN SHOP

•

THE GRINDRITE



HEAVY DUTY MODEL

Developed by us because of our need for faster grinding.

As a stock remover it cannot be excelled.

Used in this country and abroad by representative manufacturers.

Will reduce your grinding costs like it has ours.

•

SPECIFICATIONS

Weight	600 lbs.
Height over all	58"
Floor Space	29"x33"
Motor	1 H.P.
Speed	1750 R.P.M.
Type	A.C. or D.C.
Volts	220 or 440
Grinding Wheel, 8" Dia. 3½" face	

There is also the highly efficient Jr. Model—a unique portable bench type.

•

Write us for descriptive circular and list of users.
or
We will arrange a convincing trial for you.

KOESTLIN TOOL & DIE CORP.

3605 Humboldt Ave. **Detroit, Michigan**

When you order or write about products described in TDM PROGRESS please mention the publication.

"The New Precision Sawing in Tool and Die Making"

By L. A. Wilkie, Pres.

Continental Machine Specialties, Inc.

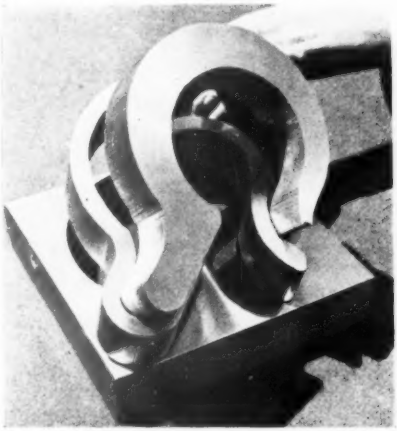
NOT many years back, the TDM industry was offered standardized production die shoes. The sweeping and universal acceptance of production die shoes and the resulting efficiency is just one symbol of the Industry's progressiveness. Now a new cutting process looms before the Industry which represents another big step forward. Precision, continuous sawing is destined to make sweeping changes in tool and die making practice.

The scope of this new method is so broad that a discussion of its applications and its new technique is a timely subject. Narrow blade band sawing calls for the use of special metal cutting band saws which are $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{16}$, or $\frac{3}{4}$ inch wide.

Use of these narrow blade saws for internal cutting, and for intricate contours in thick sections of steel, requires an entirely new type of machine. As in all machine tools, the precision band saw must have a great deal of solid foundation and framework to surround the cutting unit. It must have accuracy comparable to that of a precision bench lathe and the ruggedness of a milling machine.

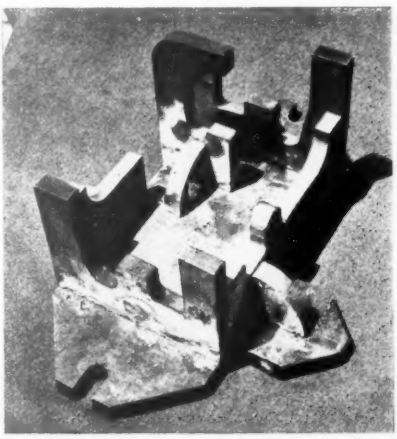
Another very essential factor in the success of narrow blade sawing is use of the correct operating speed for each job. The saw must travel at the rate of 75 feet per minute when cutting high chrome, high carbon steel. When cutting aluminum, the saw must travel at 450 feet per minute. Within this wide range of cutting speeds, each different kind of metal and each thickness of job requires a different cutting speed. To provide the exacting speed requirements, an infinitely variable speed is essential. It is also necessary to have an indicator to show the operating speed. If an incorrect speed is used, the saw will tend to burn up or will not cut properly. The exact speed required for each job is readily learned with a little experience in narrow band sawing.

While the technique of narrow blade sawing is an entirely new one, it is



The outside periphery of this large hook shape was cut in 2 hours. The inside cut-out of the same shape was completed in 1½ hours. The material is 2" oil hardening tool steel.

2½ hours is all that was required to complete this entire jig, which effects big savings over making a pattern and casting. The component parts are cleaner cut and more accurate than "torch cutting."



readily grasped by the machine tool operator and die maker. A work feed of a carefully controlled, constant pressure is necessary for most efficient operation. The machine is one that encourages craftsmanship and skill, because the operator's hands and judgment play an important part in cutting out intricate jobs.

Applications

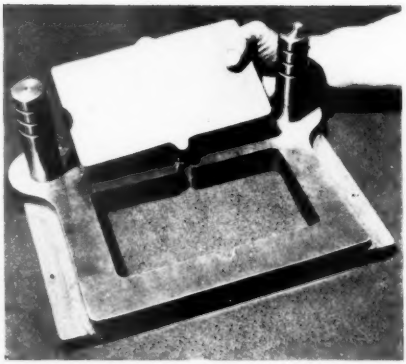
The costly method of drilling a row of holes, hammering out the slug, and filing off the drill marks in order to make an inside cut-out is made obsolete with internal, precision sawing. Holes in die shoes and the cut-outs for the die, stripper plate and pad are made with savings up to 90% over the cost of the old method.

The narrow blades have the ability to cut through steel up to 8 inches in thickness. This capacity makes possible the obvious application of stacking up several plates where duplicates of a certain shape are required. This feature has excellent possibilities in die making where identical holes often are required in die block, stripper plate, and punch holder. By dowling these parts together, they may have the contour sawed in all of them simultaneously. Other toolroom applications for narrow blade band sawing are cutting out shapes for forming dies, and making screw machine cam blanks, templates and sample parts.

Component parts that are sawed to shape and then electrically welded into assemblies for drill jigs, fixtures, etc., result in a quick process of obtaining units that is economical and efficient. Work may be held in a jig or fixture mounted on the table of the saw as in other machine tools. The fact that a narrow, deep slit may be cut on a curve makes possible the solution of certain difficult operations that could not be accomplished in any other way.

Cuts Smooth and Clean

Narrow blade sawing has broad applications in the type of work done by the gas torch cutting processes. Sawing leaves a clean, smooth cut and cuts through appreciable thicknesses. It does not burn the edges of the cut and, hence, has several advantages over flame cutting methods. It does more intricate, accurate work than is possible with flame cutting. The cost of saws and speed of



Clearance is put in with the saw, and the clean cut makes no further finishing necessary. This cut-out through 1½" steel was made in 28 minutes.

cutting result in more economical operation. However, it supplements rather than replaces torch cutting, as its field is for smaller or more intricate parts, while flame cutting is for roughing out and for larger parts.

Edge of Blade Annealed

Only a few of the several manufacturers producing metal cutting band saw blades make the narrow ones. Rapid strides have been made recently in the development of these narrow band saw blades. They are standardized at 0.025" thick, and have the back edge of the band annealed. The hardness extends only to the base of the teeth and the teeth cannot be reset or re-sharpened. Three tempers are available, these being classed as soft, medium, and hard. The number of teeth per inch varies from 10 to 32. Tooth construction is of three distinct types, namely: Raker tooth, wave tooth, and straight tooth.

Life Depends on Usage

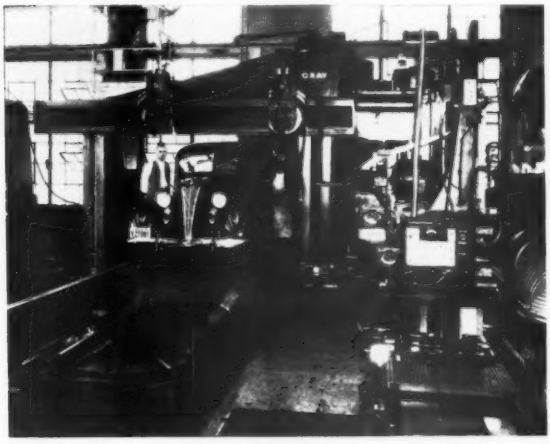
The saws are available in coils up to approximately 100 foot lengths. Their cost is $0.07 to $0.13 per lineal foot, which is extremely low for so efficient a cutting edge. Saw life depends upon usage, but an average ¼ inch wide-7 foot band, which costs about $0.70, will easily cut through over 100 lineal feet on 1-inch thick cold rolled steel before it is ready to be discarded.

When you order or write about products described in TDM PROGRESS please mention the publication.

SHOPS OF THE INDUSTRY

I—Koestlin Tool & Die Corporation, Detroit, Michigan

This is the first of a series of articles describing interesting shops of the TDM Industry. The purpose of the series is not to advertise the individual shop but rather to present to interested executives in other industries evidence of the skill, experience and facilities which are available to them in the Tool · Die · Machine Contract Shops of the country.—Ed.



A Hudson 1936 Sedan nestles comfortably under the cross rail of Koestlin's new Gray Planer whose capacity permits the machining of castings which measure 140" × 250".

THE trend is to DIES—larger dies and more of them. One needs only to stop for a moment and name thoughtfully the industries which are going into ever higher production figures, to realize this.

Outstanding, of course, is the automotive industry with its all-steel passenger car bodies. Eliminate wood and you add steel—usually steel stampings, and they require dies.

The determination to make the automobile body safer has brought the all-steel top, with its greatly added strength. Complete body re-designing becomes necessary, and because from the production standpoint it is less expensive to manufacture and handle one piece than to make and assemble two or three, automobile body engineers are thinking today in terms of fifty and sixty ton dies.

But automobile passenger cars are not alone in their demand for more and larger sheet metal dies. The commercial truck body is going into production with an all-steel top. The new de luxe busses, the home-on-wheels trailer, the 100-mile-an-hour streamline trains, the artistic up-to-the-minute refrigerators—all of the go-getting industries who make these and 1001 other products are calling upon the die shops of the nation to increase their facilities. Modern dies are producing more intricate products of better quality and workmanship than ever before.

Among the TDM Industry's representative die manufacturers is the Koestlin Tool and Die Corporation of Detroit, sometimes referred to as the country's largest independent exclusive die shop.

In a recent interview Foster L. Fralick, vice president and general manager of the corporation, stated:

"Present indications point to an increased demand for new dies and tools for some time to come. We believe that the Industry will carry on in very satisfactory volume, and our confidence is attested by the purchase of more than

$100,000 of new machine tools and equipment so far this year."

Koestlin recently added another *Keller Automatic Tool Room Machine*—the profiling machine which automatically reproduces many kinds of dies for blanking, trimming, piercing, punching, extruding, forging, stamping and casting, as well as cams, templets, gages, jigs, molds and patterns. This department now has four *Kellers*, two of them the largest models obtainable.

A *Gray Planer* which was recently installed is probably the largest capacity machine for handling wide work, in the Detroit industrial area. It is designated by the manufacturer as a *Convertible Openside Planer*, 120 inches wide by 78 inches high. It has an 18-inch stroke, two heads on the cross rail, and right-hand side head, and has an arrangement for reversing motor drive.

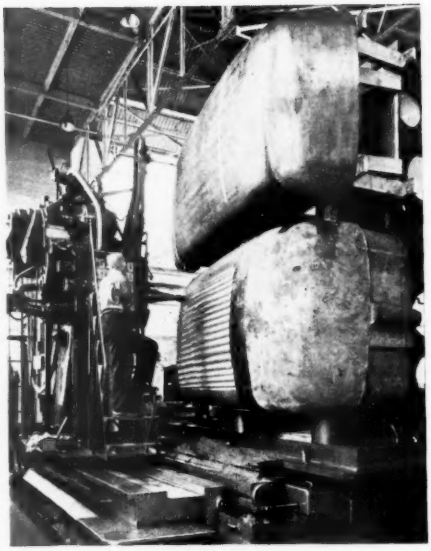
The width of the table is 68 inches and the machine is provided with a supplementary table which runs on a steel I-beam to support large overhanging work. It is equipped with every time-saving feature developed in recent years, including automatic power clamping of the cross rail and triplex control—e.g. feed and rapid traverse control at both ends of the rail and at the heads. The left-hand housing may be quickly removed to permit planing extra wide work which the space between the housings will not accommodate.

The machine is equipped with four *Reliance Motors* and *Cutler Hammer Control*. The capacity of this planer permits the machining of castings which measure 140 by 250 inches, and the illustrations in this article show a Hudson sedan easily accommodated on the planer table and tucked away under its cross rail. In one setting the surfaces of the 186-inch nickel iron blank-holder ring castings for the Chevrolet commercial body top were planed. Compare the casting with the two men who have stretched out on it.

In another view is a *Giddings & Lewis Horizontal Boring Mill* engaged in milling the inside of the draw ring for the pad and punch to be used with this same Chevrolet die. This casting weighs 20 tons and the special cutter and cutter bar which are being used were made in the Koestlin shop.

This boring mill is *G & L's No. 56*

(Continued on page 12)



Punch for Chevrolet Commercial Body Turret Top in process of profiling on Keller Machine. Contour of mahogany model is being automatically reproduced on 18-ton nickel-iron casting.

Planing in one setting, draw surface of blank-holder ring used on all-steel panels for Chevrolet Commercial Turret Top. Over-all length of casting 186".

Good News

The purchase of new machine tools and equipment, the increase of personnel, additions to factory space, are always news—good news. You are invited to write us about purchases and additions which you have recently made—in fact anything that shows the progress which Industry is making every day.—Ed.

Tools & Gages, Inc.—Cleveland

About September 15th the Société Genevoise—Switzerland—are shipping this TDM shop one of their Jig Boring Machines, generally known to shop-men as the *Swiss Jig Borer*. It will be equipped with circular table and the accessories will include an American tool head, the new *Precision Universal "adjustable while running"* head made by the Precision Tool Company of Bridgeport, Conn.

Another interesting purchase made by Tools & Gages, Inc. is a large model *Gorton Super-speed Vertical Milling Machine*.

Majestic Tool & Manufacturing Company—Detroit

This company is completely installed in its new plant at 2950 East Woodbridge St. Occupying most of the first and second floors of the building, the company will now have space into which to expand. An increased volume of general tool and die contract work has already made the installation of additional equipment necessary. The expansion of facilities also provides the opportunity for increasing the facilities in the department which makes the *Parker* High-Speed Grinding Spindles.

The Bunell Machine & Tool Company—Cleveland

A Continental *Do-All* Continuous Sawing and Filing Machine has been installed by Bunell. It is a Model JD, complete with standard equipment plus the new automatic power work feed and a special 220 volt 3-phase electric motor. Other additions to equipment are a Niagara *Model A-4* Open Back Power Press and a No. 136 Gap Squaring Shear.

Star Tool & Die Works—Detroit

WORD comes from Timothy Meadows, president of the Star Tool and Die Works of Detroit, of the purchase of another *Keller Automatic Tool Room Machine*, the profiler made by the Pratt and Whitney Company.

The Cincinnati Planer Company is about ready to ship Star one of its new 60" *Hypro Openside Planers*. The Giddings & Lewis Machine Tool Company also has received from Star an order for a *Model 56* Horizontal Boring Mill with a 60" x 120" table and 108" cross feed. The Company's factory is being enlarged to house these new machines.

Dienelt & Eisenhardt, Inc.—Philadelphia

After a season of extreme activity in the building of special machinery for the *hard-surface floor-covering industry*, this company has made good use of the slackening in demand for this type of equipment to improve and expand facilities in its erecting shop. Alterations which have been made will greatly facilitate manufacturing operations. It is interesting to note that this company is in its 62nd year of successful operation. In the Philadelphia industrial area it is recognized as a specialist in Cylindrical Grinding up to 18" diameter x 162" centers, and 24" diameter x 96" centers.

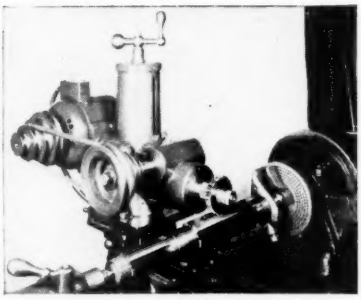
Lyons Machine Company—Cleveland

Another *Smith and Mills* Shaper has been added by this shop. This makes a battery of four. The latest one is the new 12" High-Speed Back Geared model. Also, a *No. 33* Abrasive Surface Grinding Machine of the vertical spindle type has been installed. Equipped with magnetic chuck, this grinder is particularly efficient for small jig and fixture work.

A New Lathe Converter with Multiform Application

LATHE and other machine tool attachments designed to perform operations other than that for which the original machine was intended have been built and used for years. Usually such an attachment adds one other operation, therefore an attachment which will readily convert a lathe into almost an all-round tool room machine is interesting.

The *Master Lathe Converter* has recently been developed and is now being manufactured by the Master Brake and Appliance Company. It has been designed to meet the demand for a so-called universal-range precision machine which may be sold at a moderate price and which, in numerous instances, will take the place of more expensive individual purpose machines. The *Master Lathe Converter* is said to be exceptionally dependable for mill work, broaching, internal grinding, angular milling, end milling, tool grinding and re-facing of valves.



The illustration shows the Model A *Master Lathe Converter* mounted on the compound rest of a lathe and performing a milling operation on a spline shaft. It will be readily noted that this machine is separately motored and power is transmitted to the milling head by way of a V-type belt. A variety of speed changes can easily be obtained through

(Continued on page 20)

DARWIN

FOR SUPERIOR QUALITY

Inventors of Modern High CHROMIUM STEELS for Quantity Production with Press-Tools . . . .

"NEOR" — "COBALTCROM-P.R.K"
"DARWIN No. 1" — "H" Brand
"PRK" and "H" also in the form of Castings

Pioneers of Cobalt-Alloyed High-Speed Steels
Also supplied in the form of Tool-Bits

AUTOMOTIVE CARBON DIE
Carbon Vanadium Water Hardening Steels

DARWIN & MILNER, Inc. 1260 West Fourth St.
TELEPHONE MAin 9655 CLEVELAND, OHIO

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Japan, China, Russia Use Die-Making Machine Made in America

PIONEERS in the development and manufacture of the reciprocating type of die making machines, the Oliver Instrument Company of Adrian has achieved an enviable record. Since E. C. Oliver originated his method of sawing out the slug from dies instead of drilling and chipping it, more than 10,000 Oliver die making machines have been manufactured and shipped to all parts of the world, including such distant points as Japan, China, India, Africa, Russia and New Zealand.

Industry's ever changing requirements —new products to be made, new and harder materials to be cut—have been met by continual improvement, and particularly is this evident in the *Oliver Heavy Duty Model* with its capacity for sawing and filing metal up to 3" in thickness, and filing still heavier stock with a shorter stroke.

Because of the need for ever more rugged machine tool construction, this *Heavy Duty Model* has been accorded an unusually enthusiastic reception. It is equipped with every device required for the rapid and accurate production of dies, gages, cams, stripper plates, templates, etc.

The reciprocating method of operation, used on all Oliver models, permits instant set-up, quick change from one die section to another—no lost time—low cost of files and saws and an opportunity to complete the job on ONE MACHINE. Each model will handle both large and small files in all standard and special shapes, thereby enabling the operator to file in the very small slots and intricate shapes so often found in dies today.

The Oliver Die Making Principle and the various machines necessary therefor are described in a new circular which will be mailed upon request to Oliver Instrument Company, 1416 East Maumee St., Adrian, Michigan.

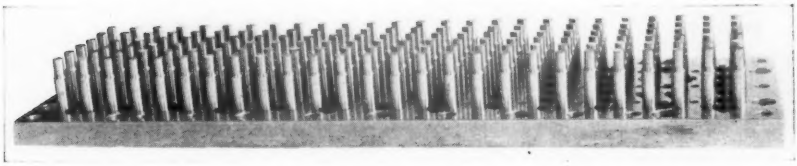
ONE PIECE

GROUP PUNCH PLATES

ANY SIZE **ANY NUMBER OF PUNCHES**

QUICK CHANGE *and* **INTERCHANGEABLE**

Absolute Lock **Immediate Release**



Group plate containing 156—.400" diameter punches made for the world's largest manufacturer of radiators.

Our estimates will interest you. Let us quote.

•

HOVIS SCREWLOCK COMPANY

3129 East Larned Street **Detroit, Michigan**

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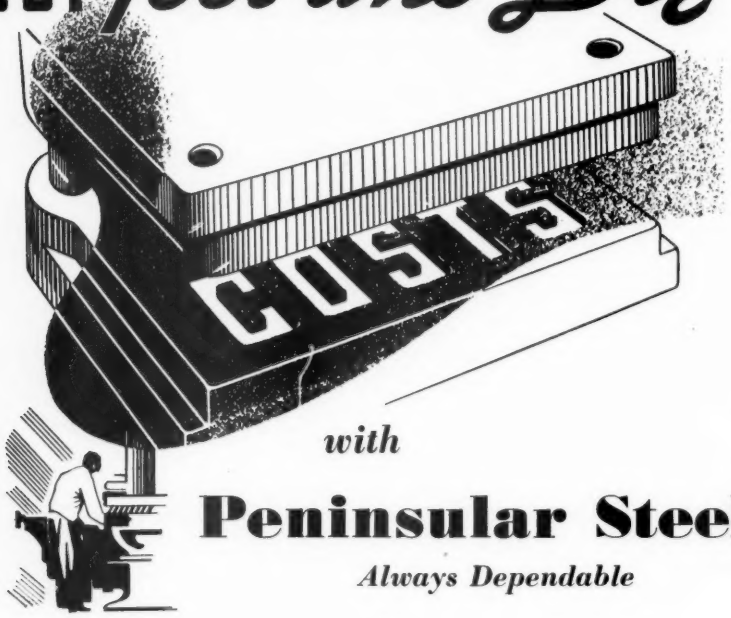
CUT *Tool and Die* COSTS



with

Peninsular Steels

Always Dependable

24 HOUR WAREHOUSE SERVICE

on

Tool and Die Steels

High Speed Steels

Cold Drawn Steels

The Peninsular Steel Company

Walter O. Kurtz, *Sec'y-Treas.*

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DAYTON: 905 E. 3rd St. Adams 3121

DETROIT: 1030-36 McDougall Ave. Fitzroy 5496

TOLEDO: 1915 Spielbusch Ave. Main 5171

Chicago Representative
WM. N. PHARES
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Telephone: 8-7723

Akron Representative
JAMES A. SHATTUCK
42 East South St. - Hemlock 2193

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FIRTHITE CEMENTED CARBIDE TOOLS

We Design and Fabricate All Types: Standard, Semi-Standard, Special and Particular.

ALL TOOLS FINISH-GROUND ON DIAMOND WHEELS

Copper Brazing Service • *Prompt Delivery* • *Standard Tips in Stock*

LYONS MACHINE COMPANY

5601 TILLMAN AVE. WOodbine 2440 CLEVELAND, OHIO

New, Stronger End-Mill Doubles Production

A NEW end-mill (patent applied for) manufactured by The Weldon Tool Company, 323 Frankfort Avenue, Cleveland, Ohio, is stated to embody several unique features of design which permit it to be fed into the work from two to three times as fast as ordinary mills, without the risk of breakage. Since the cause of practically all end-mill breakages is the clogging of the chips under the end and in the flutes, the end of the new mill is deeply cupped and the spaces between the flutes are made unusually wide, and of such a form that the chips are more positively ejected. Tests made by the manufacturers in various machine shops show that the new mill will take a feed as high as 14 inches per minute on a ⅝" diameter mill on oil-hardening tool steel; as compared with less than 6 inches per minute, which is in itself considered an excellent performance.

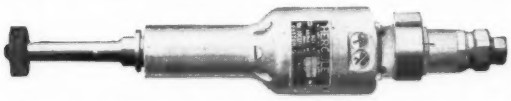
Meado Products of Detroit Open for Stamping Contracts

BUYERS of stampings will welcome the announcement that a portion of the extensive facilities of the Meado Products Company, 2530 Twenty-Fourth Street, Detroit, are available for contract manufacture of sheet metal stampings.

This company's modern facilities include presses with capacity up to 900 tons. Having in its organization die engineers of long experience, the company is able to assure the manufacture of stampings to the most precise specifications. The company's equipment for flash and projection welding is also available for complete or partial assembly of stamped parts.

Ford-Johansson Gage Block Book Available

There have been requests for copies of the *Johansson Gage Block* story, "He Measures in Millionths," which appeared in the June and July issues of TDM PROGRESS. We have copies of this available in booklet form and will be pleased to supply them upon request.



A "HERCULES" Pneumatic Pencil Grinder That is Small, Light and Fast.

Especially designed for use with small emery wheels and pencils, rotary files, etc. Light—high speed—free from vibration—excellent for close quarter work, finishing or touching up dies without removing them from the machine. No. A. 113-3; speed—21,000 R. P. M.; capacity—up to 1½" vitreous and 2" organic bonded emery wheels; weight—3½ lbs.

THE BUCKEYE PORTABLE TOOL CO. DAYTON, OHIO — HERCULES

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ALLOY HY-TEN STEELS
ALSO POPULAR S.A.E. ALLOY GRADES

SUITABLE FOR A WIDE VARIETY OF USES

HY-TEN "M" TEMPER
Oil Hardening Alloy Steel
For parts requiring great hardness, density of structure, resistance to wear, combined with toughness.

HY-TEN B No. 3X
.50 C. High Man.-Chrome-Moly
Machinable in heat-treated condition at hardnesses up to 42 Rockwell "C" (401 Brinell) or even higher.

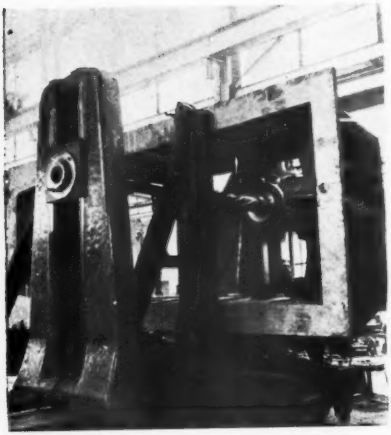
Warehouses CAMBRIDGE CHICAGO CLEVELAND

WHEELOCK, LOVEJOY & CO., Inc.
SEND FOR DATA SHEETS

Warehouses DETROIT NEWARK BUFFALO

Shops of the Industry

(Continued from page 6)



Full depth of 48" inside draw ring surface being milled in one setting on a Giddings & Lewis Horizontal Boring Mill. Casting of nickel-iron, weight 20 tons.

High-power Precision Horizontal Boring, Drilling and Milling Machine—a favorite among builders of large dies. One of the outstanding features of this machine which makes it so adaptable for large die work is the control, it being possible to operate the headstock feed independently from the table feed, permitting the operator to manually inch along either one of the feeds, following die contours.

An excellent idea of the shop layout may be had from a view of the finishing floor. In the foreground is a draw punch for a Chevrolet all-steel turret top. The men at work are highly skilled punch finishers.

The Koestlin Corporation has already built six complete sets of dies for the new all-steel tops adopted by automobile manufacturers. Of these, several of the dies alone reached a weight of 78 tons each.

(Continued on page 26)

SHEET METAL STAMPINGS
OF EVERY DESCRIPTION

FLASH *and* PROJECTION WELDING

Die Engineering Service ***Assembling***

MEADO PRODUCTS COMPANY
2530 24th St. ***We have the facilities*** **DETROIT, MICH.**

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OLIVER · of · ADRIAN
DIE MAKING MACHINES

Reduce... **Die Making costs 50% to 60%—they're fast and accurate on all sawing, filing and lapping operations** . . . . . .

IT IS difficult to understand why management would attempt to operate a Tool and Die department without the services of an OLIVER OF ADRIAN DIE MAKING MACHINE (two toolmakers in one machine) because the savings are so great and the cost so small (as low as $125.00 complete). Their use assures—work on time—extra profits on each job—work produced with less skilled operators.

Better start an OLIVER to work for you today and add that extra profit to your 1936 income.

The cut illustrates our ***Heavy Duty Model*** *for 3" materials—just the machine for your plant. Send for 16 page bulletin—there's no obligation.*

OLIVER INSTRUMENT COMPANY
1416 EAST MAUMEE STREET .:. ADRIAN, MICHIGAN

When you order or write about products described in TDM PROGRESS please mention the publication.

THE NEW DANLY CERTIFIED DIE SP
ARE ENGINEERED FOR LONGE

● Now, for the first time, die springs are engineered to combine long life with maximum flexibility, carrying capacity and compression.

Stress determines the life of any spring. The stress selected for each size of the new Danly Flat Rounded Die Springs produces the highest load capacity consistent with long life. In destruction tests extending over three years with every known type of spring steel, a special analysis steel of keystone section stood out as giving the ultimate in fatigue life. The properties of this steel are controlled from the melt to the finished wire in accordance with rigid Danly specifi

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the highest state of perfection
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zone furnace control, supple
quenching and drawing equi
quenching temperature. T
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to carry its rated load accord
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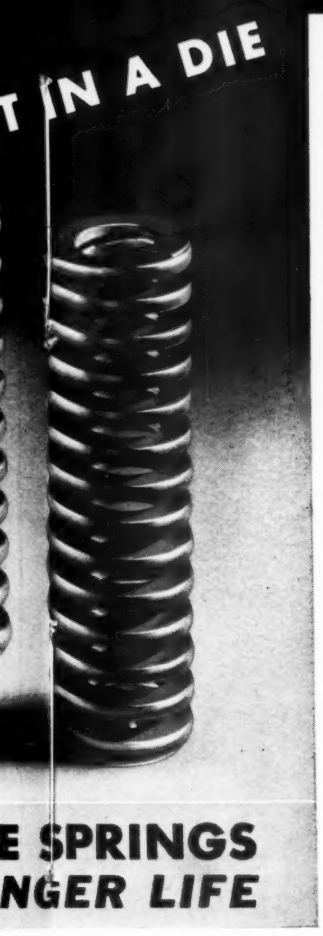
DANLY DIE SETS AND DI



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DANLY FLAT ROUNDED DIE SPRINGS

The wire is drawn like this:

Instead of the rectangular oval wire from which die springs have been made in the past, Danly springs are drawn of special spring steel wire with keystone cross section as shown at the right.

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As this keystone wire is coiled, it assumes the shape shown here with rectangular cross-section to give it equal section and equal strength on both inside and outside spring diameters; greater carrying capacity for hole size.

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Published in the interest of
Manufacturers and Users of
CUSTOM-BUILT TOOLS, DIES, MACHINES AND ACCESSORIES

GEORGE J. HUEBNER . . . . . Editor
P.O. Box 3561, Cleveland, Ohio

Official Publication of the
SPECIAL TOOL, DIE AND MACHINE SHOP INDUSTRY
3500 Members in the U.S.A.

Special Tool, Die and Machine Shop Institute
A National Trade Association

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Secretary—GEORGE J. HUEBNER
Cleveland, Ohio

New Methods Cut Costs

SHOPS of the TDM Industry have been known for years as skilled-worker shops. Because so much depends, in the manufacture of tools and dies, upon the skill of the individual workman, it is frequently believed that the machine tool and other equipment used are decidedly of secondary importance.

The practice of basing price estimates on new work upon the average shop wage rate, frequently not taking into consideration the varying costs of operating different machines, further substantiates the tendency to think solely in terms of labor hours.

It is true that the cost of building a tool, a die or a machine is largely wages paid to labor, but this labor is of two kinds, hand or bench and machine. The trend in all industries is undeniably toward less of the former and more of the latter. The TDM Industry is no exception.

The new tool and die and machine shop equipment embraces machines to which every modern shop owner and executive must give careful consideration. In fact, it is difficult to conceive of a job or contract shop being able to successfully compete today without having some of this new equipment.

A very common complaint in this Industry is that competition is extremely keen. It is true, but it is not always due to price cutting and the use of too low rates in estimating. There are many alert shop executives who have developed short cuts, who have bought and are using the most modern of die and tool making equipment. The use of carbide tipped tools frequently cuts the time for an operation fifty per cent, the use of the new sawing and filing machines, high speed shapers, planers and mills, faster grinders, portable grinders, with the proper shapes and sizes of abrasive tools, care in the selection of steels—all of these contribute to lowering of costs. Tool shop owners and executives owe it to themselves to learn about these new and faster ways of turning out their products. Almost invariably new equipment can be bought on a small down payment and long terms, and most of it pays for itself from savings.

Astute shop owners and executives are taking the attitude that they can learn something new every day. They are investigating new equipment and studying new methods. They are sending for and reading books and treatises which can contribute to the more successful operation of their shops. And this includes schooling their men, making available all literature that will teach them how to do a better job.

Hudson River Valley Division Resumes Regular Meetings

ON September 8th in the Pennsylvania Hotel, New York City, the Hudson River Valley Division of the Special Tool, Die and Machine Shop Institute will hold its first meeting of the fall and winter schedule.

All manufacturers of tools, dies, special machines and general machine shop products are invited to attend this meeting at which an interesting program of meetings will be arranged for. Last winter's schedule included discussions of subjects having to do with the many problems which arise in contract shop operation.

Officers of the Hudson River Valley Division are: President, Sidney Diamant, who is president of the Diamant Tool & Mfg. Co., Inc. of Newark, N. J.; Vice-President, Fred C. Danneman, president of the F. C. Danneman Co. of New York City; and Secretary-Treasurer, B. B. Beck, president of Mechanical Die & Tool Co., Brooklyn.

RE-ORDERS: Another proof of DOALL value, American Can bought 4 machines; American Stove 4; General Electric bought 8; Crowe Name Plate bought 3; General Motors Truck bought 4; etc., etc., etc. In Rockford, Illinois, ...the city that KNOWS machine tools best, there are now 12 DOALLS in use!!!

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"Engineering Shop Practice" deals with the relation between the design of the part, the material of which it is to be made, the method of fabrication by which the material is to be prepared, and the machining processes involving the machine tool, fixtures, cutting tools, speeds, feeds, lubricants, etc.

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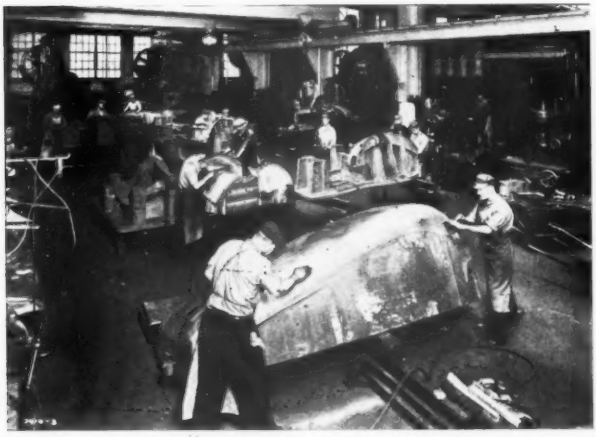

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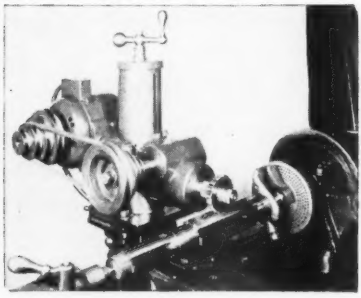

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Representatives wanted.

A New Lathe Converter

(Continued from page 8)

the use of two four-step cone pulleys. A worm gear is utilized in the milling head to obtain a 22 to 1 ratio for the milling spindle, thereby assuring a large amount of power for the milling cutters. There are five ball bearings in the milling head, two of which are fitted into the extreme end of the head to take up end thrust and to assure a minimum of friction and play in the spindle.

The same machine is used for grinding operations, simply by substituting the grinding head for the milling head, using the same chassis and motor. The change from one head to the other is a very simple operation and requires the removal of only three bolts. As tool post grinders, the *Master Lathe Converters* have a range far greater than that of any tool post grinder heretofore put on the market, in that the vertical range of 11″ to 12″ allows them to be raised above the work in order to come down through the flutes such as on hobs or reamers, thereby grinding the faces of such tools rather than outside diameters only.

Four sets of holes are provided in the base plate, one each in front and rear and one on each side of the center post so that the machine can be mounted on the compound rest, in direct line with the cross-feed or at right angles. By this arrangement of set-up any angle may be obtained for end milling, drilling, or grinding operations.

By using an internal grinding head with an extended casting and bearings at the extreme end of the casting, it is possible to do internal grinding to approximately 14″ with the Models A and M. A spindle speed ranging from 1750 to 4750 RPM can be attained with the present set-up of the grinding head. Higher speeds may easily be attained by changing the size of the pulleys, and the bearings are capable of taking up to 20,000 RPM. The grinding wheel can be changed almost instantly from a left to a right hand grinder merely by reversing the position of the wheel and pulley on the grinding spindle and changing the pulley on the drive shaft of the motor from the right to the left side. The motor, however, must be off-set to the right by changing two set screws in the bracket. The direction of the motor itself may be changed by two methods,

(Continued on page 25)

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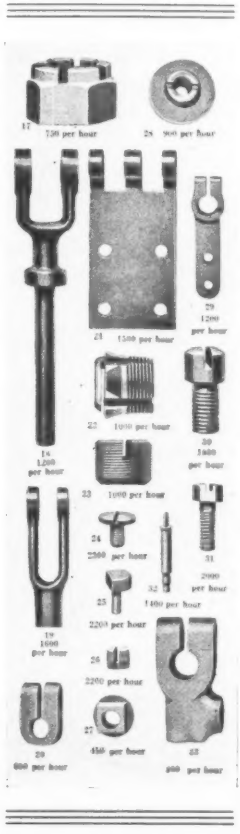
The Principle of Continuous Milling Applied to Slotting and Castellating

IN the manufacture of metal products there are thousands of special screws, nuts, washers, clamps, plates and similar parts which require slotting, castellating or a special milling operation, which of itself is comparatively simple but the cost of which can be out of proportion to the operation. A few of these are shown in the illustration herewith.

The new *Craftsman* Rotary Milling Machine, of which Sommer & Adams Company, 18511 Euclid Avenue, Cleveland, has just completed and shipped the first of a new and greatly improved model, performs these operations semi-automatically and with such rapidity that the cost is much lower than by any other process.

The *Craftsman* is the only completely successful milling machine of its kind. A continuously rotating chuck accommodates the pieces to be milled. For castellating or screw-slotting there is a standard chuck made of three plates of machinery steel carbonized. The outer plates are approximately ¾" thick and full diameter. The driving plates are attached to the cast-iron drum. The floating plates, slotted to a depth of 2" to 3" form an independent jaw for each part to be milled, and run loose on the shaft on which they are mounted to permit a swivel motion. The outer plates are held in position by a heat-treated alloy steel shaft. Two rollers make contact with the rotating chuck at the point where the work moves against the cutter and since each part is held independently, any reasonable variation of size in the pieces passing through is automatically taken care of.



An operator feeds the chuck from a spreader and the speed for many products is limited only by the rate at which the operator can feed the machine.

The cutter is driven by a hardened and ground steel spindle which is carried on a swinging head and mounted on Timken Roller Bearings. This swinging head provides the adjustment for depth of slot and variation in size of pieces to be milled.

The cutter-spindle is backed-geared, and the central shaft which propels the chuck is worm-driven, thus assuring ample power. The worm-gear is provided with a clutch, and slip-gears are arranged to give thirty changes to the feed.

The pieces in work are milled by being fed into the chuck as it rotates. On approaching the cutter each independent jaw of the chuck is automatically closed and since the piece is tightly gripped between the jaws themselves and is also resting upon the central plate, positive alignment is assured. After the work leaves the cutter, the spreader automatically opens the chuck and releases the work into a chute.

One of the decided improvements made in the design of the new model concerns the changing of chuck-plates. It is no longer necessary to remove the drum and shaft as a unit—drum remains in place as part of the

(Continued on page 25)

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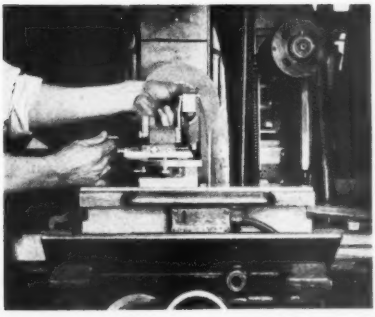

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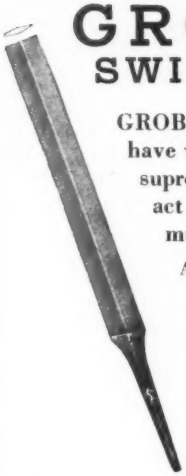
Principle of Continuous Milling

(Continued from page 21)

machine and the plates are removed by the simple withdrawal of the shaft, making it possible to change the chuck plates in a period of ten to fifteen minutes. This one improvement reduces the machine's idle time to a marked degree.

The *Craftsman* Rotary Milling Machine is equally adaptable to straddle and plain milling. Any manufacturer making screw products which require slotting, castellating or milling in a special way cannot fail to realize a reduction in cost because of the greatly increased production.



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A New Lathe Converter

(Continued from page 20)

first by merely inverting the motor on the telescope rest or by loosening two set screws and changing the direction of the brushes. On account of these various changes of position of the wheel, motor direction, etc., grinding operations which would ordinarily present quite a problem are easily accomplished.

The *Master Lathe Converter* approaches more nearly the solution of the need of a universal attachment than anything heretofore developed. It is already in use in tool shops, general machine shops, large and small industrial plants, railroad shops, road maintenance departments, various government mechanical units, and it is an invaluable "machine tool" in any plant where an engine lathe is used.

The *Master Lathe Converter* has a low original cost and among the the advantages claimed for it are its ease of setup, saving of floor space, and universal range.

The Master Machine & Tool Company, Armour and Erie Streets, North Kansas City, Missouri, is sole distributor.

When you order or write about products described in TDM PROGRESS please mention the publication.

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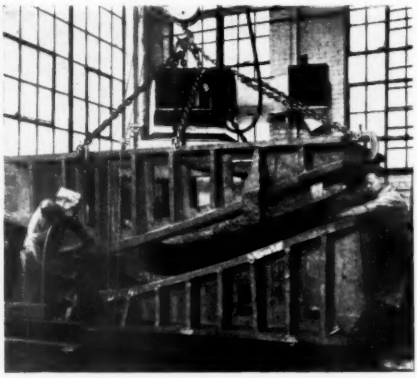
Stampings Light Manufacturing

Shops of the Industry

(Continued from page 12)

Other illustrations accompanying this article portray graphically the huge size of these new dies and the equipment necessary to manufacture them, but included in the Koestlin shop facilities is a department for making the dies required to turn out also the smallest stampings. Here are employed men with the skill and experience necessary for this precision work, and there are batteries of lathes, shapers and grinders.



Fitting top and bottom draw rings of punches for the Chevrolet Commerical Turret Top.

An interesting specialty made by the Koestlin Corporation is the *Grindrite* grinder, developed in its own shop for particularly heavy-duty service and in use today in the shops of many of the country's outstanding heavy products manufacturers.

Koestlin operates its own pattern shop which not only serves the Detroit industrial area but produces annually for manufacturers outside of Detroit patterns for more than one million pounds of castings. Operating at full capacity, the Koestlin Tool & Die Corporation has close to 400 employees. Its shop has more than 40,000 square feet of floor space and the building is of the modern daylight type. Crane facilities cover every square foot of the floor. This assures the proper handling of all castings and finished products.

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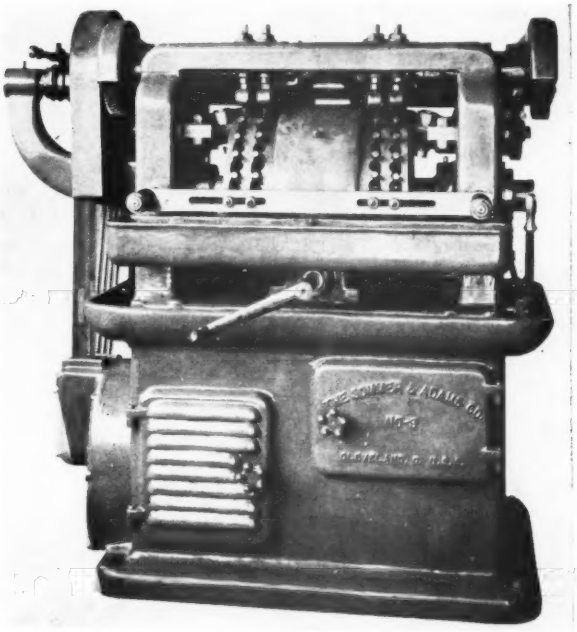

USES OUR CONTINUOUS MILLING PRINCIPLE

This new model described on page 21

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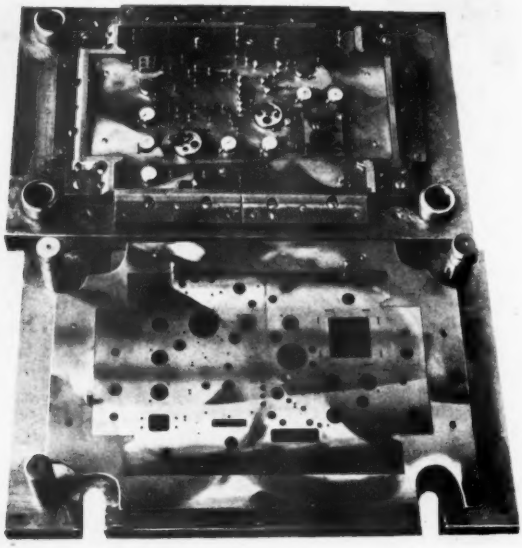
We specialize in the manufacture of *medium and small* dies and solicit the opportunity to submit estimates.



Blanking and piercing die for manufacture of a radio chassis. Extreme accuracy was required—limited to .002" tolerance. Note detail.

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